

## TABLES

TABLE 1

PROPERTY OWNER AND ACCESS INFORMATION  
FRUITLAND FORMATION OUTCROP MONITORING 2007  
ARCHULETA COUNTY, COLORADO

ID Number	Parcel Number	LTE Access	Physical Address	Owner Name	Mailing Address	Mailing City	Mailing State and Zip	Legal Description	Parcel Size (acres)	Geographic Position
1	568301100001	Access		Federal					0.000	
2	568501100001	Access		Federal					0.000	
3	568333200010	No	W HIGHWAY 160 X ESMT	HALVERSON HAROLD D ESTATE	23541 COUNTY RD S	DOLORES	CO 81323-0000	35-5W SEC 33	278.913	107.4276285W 37.2588724N
4	568510300009	Access	W HIGHWAY 160 26410	EDWARDS DURWOOD	710 E HOLLAND	ALPINE	TX 79830-0000	34-5W SEC 10	12.495	107.4170414W 37.2288842N
5	568505100016	No Response	W HIGHWAY 160 28061	KAHLER NOBLE GENE	PO BOX 405	BAYFIELD	CO 81122-0000	34-5W SEC 5	8.277	107.4397366W 37.2475521N
6	568505200020	No Response	W HIGHWAY 160 28444	INN ABOVE ONION CREEK INC	4444 HWY 150 WEST	KYLE	TX 78640-0000	34-5W SEC 5	245.669	107.4488552W 37.2467916N
7	568332300040	NA	W HIGHWAY 160 28644	COLORADO YELLOW JACKET LTD PTNSHP	PO BOX 774525	STEAMBOAT SPRINGS	CO 80477-0000	34-5W SEC 5	91.258	107.4471289W 37.2545177N
8	568332300009	NA	W HIGHWAY 160 28945	STRICKLAND SCOTT L & NIOBRA J	28945 E US HWY 160	BAYFIELD	CO 81122-0000	35-5W SEC 32	16.709	107.4437179W 37.2564906N
9	568319200034	No Response	W HIGHWAY 160 30301A	WATSON DAVID LLOYD &	30301 US HWY 160	BAYFIELD	CO 81122-0000	35-5W SEC 19	1064.422	107.4633925W 37.2839436N
10	567913300015	Access	W HIGHWAY 160 31861M	LEONARD RAMONA	PO BOX 207	MAYER	AZ 86333-0000	35-6W SEC 13	26.772	107.4807203W 37.2986948N
11	567913400016	Access	W HIGHWAY 160 31861B	PEINADO EMILIO JR & KAREN R	PO BOX 706	BAYFIELD	CO 81122-0000	35-6W SEC 13	40.098	107.4751287W 37.2974749N
12	567913400017	Access	W HIGHWAY 160 31861L	WOOD LEE THOMAS & PEGGY DARLENE	31861 L W HWY 160	BAYFIELD	CO 81122-0000	35-6W SEC 13	37.432	107.4772925W 37.2954878N
13	589701400003 SJNF	Access		Federal					0.000	
14	589528400043	No Response	COUNTY RD 917 1023	EGAN JOHN T	1023 COUNTY ROAD 917	PAGOSA SPRINGS	CO 81147-0000	34U-4W SEC 28	35.213	107.2895008W 37.1560879N
15	589528400051	No Response	COUNTY RD 917 1000A	LEISER SANDRA J		MADISON	KS 66860-0000	34U-4W SEC 28	39.470	107.2827076W 37.1606722N
16	589511200003	Access	HIGHWAY 151 368	UNITED STATES OF AMERICA T/F	PO BOX 737	IGNACIO	CO 81137-0000	34U-4W	3505.197	107.2846571W 37.1913186N
17	589528400042	No Response	COUNTY RD 917 1000	HALLOCK JAMES & NORA	1000 COUNTY RD 917	PAGOSA SPRINGS	CO 81147-0000	34U-4W SEC 28	35.086	107.2871869W 37.1588274N
18	589528400049	Access	COUNTY RD 917 1019	MUHLIG BRITT & MAYUMI	1019 COUNTY RD 917	PAGOSA SPRINGS	CO 81147-0000	34U-4W SEC 28	34.963	107.2905460W 37.1573476N
19	589528300041	No Response	COUNTY RD 917 1001	CHENAULT ROBERT G	1001 COUNTY RD 917	PAGOSA SPRINGS	CO 81147-0000	34U-4W SEC 28	34.960	107.2917877W 37.1615535N
20	589528400050	No Response	COUNTY RD 917 1000	LEISER SANDRA J		MADISON	KS 66860-0000	34U-4W SEC 28	35.036	107.2886189W 37.1615376N
21	589528400053	Access	COUNTY RD 917	WOZNY THEODORE G TRUST ACCOUNT	1601 COUNTY RD 917	PAGOSA SPRINGS	CO 81147-0000	34U-4W SEC 28	35.375	107.2872467W 37.1534398N
22	589533200046	Access	COUNTY RD 917 1601	LEON EUGENIA &	1601 A CR 917	PAGOSA SPRINGS	CO 81147-0000	34U-4W SEC 33	41.103	107.2902055W 37.1534003N
23	589533400048	No Response	COUNTY RD 917 1859	MODISETTE JERRY L & BEVERLY A	17110 CYPRESS ROSE HILL DR	CYPRESS	TX 77429-0000	34U-4W SEC 33	39.371	107.2873806W 37.1462336N
24	589533100045	No Response	COUNTY RD 917 1590	MISER PATRICIA	2341 JOY AVE	WHITE BEAR LAKE	MN 55110-0000	34U-4W SEC 33	42.697	107.2833805W 37.1498740N
25	589533100047	No Response	COUNTY RD 917 1589	SCHAEFER JAMES & NANCY	2754 S LAS PALMAS	MESA	AZ 85202-0000	34U-4W SEC 33	36.129	107.2874029W 37.1498359N
26	589533400033	No Response	COUNTY RD 917 1818	MODISETTE JERRY L & BEVERLY A	17110 CYPRESS ROSE HILL RD	CYPRESS	TX 77429-0000	34U-4W SEC 33	39.329	107.2828948W 37.1462775N
27	589533400034	No Response	COUNTY RD 917 2255	ADAM ROBERT J	12611 JONES RD STE #200	HOUSTON	TX 77070-0000	34U-4W SEC 33	39.331	107.2874383W 37.1426306N
28	568510300010	No Response	W HIGHWAY 160 26260	DREW DANNY S	PO BOX 13	CHIMNEY ROCK	CO 81127-0000	34-5W SEC 10	17.346	107.4141421W 37.2285446N
29	589712400002	No	COUNTY RD 175 2117 & 2119 & 2121	COONEY PROPERTIES 21 LLC	33 INVERNESS PL	DURANGO	CO 81301-0000	34U-5W SEC 12	792.487	107.3344796W 37.1930959N
30	589529300027	Access	HIGHWAY 151 X	EF COAL RESOURCES LIMITED PRTN	PO BOX 773457	STEAMBOAT SPRINGS	CO 80477-0000	34U-4W SEC 29	157.152	107.3074462W 37.1570456N
31	589725400016	Access	HIGHWAY 151 6971	MARTINEZ AMOS MEL	2400 COUNTY RD 329	IGNACIO	CO 81137-0000	34U-5W SEC 25	19.762	107.3412769W 37.1560602N
32	589711200001	Access	W HIGHWAY 160 24160	GRUB JOHN	2841 WANDER CIR	SALT LAKE CITY	UT 84117-0000	34U-5W SEC 11	159.274	107.3596091W 37.2093422N
33	589725100011	No	COUNTY RD 193 5801	CANDELARIA ROGER	9105 SIXTH ST	LANHAM	MD 20706-0000	34U-5W SEC 25	60.135	107.3412773W 37.1659743N
34	589725400015	No Response	HIGHWAY 151 6505A	VAUGHN LARRY C	6505A HWY 151	PAGOSA SPRINGS	CO 81147-0000	34U-5W SEC 25	19.762	107.3412769W 37.1578502N
35	589725400013	No	HIGHWAY 151 X	MARTINEZ JOHN L &	5768 HANSEN CIR	MURRAY	UT 84107-0000	34U-5W SEC 25	39.523	107.3412770W 37.1605367N
36	589724400008	No	COUNTY RD 193 X	CANDELARIA SY TRUSTEE & GILBERT	PO BOX 1771	ARBOLES	CO 81121-0000	34U-5W SEC 24	59.991	107.3390038W 37.1713890N
37	589713300006	No	COUNTY RD 193 6551	CANDELARIA SUSIE	PO BOX 1764	ARBOLES	CO 81121-0000	34U-5W SEC 13	160.288	107.3436380W 37.1849042N
38	589724400010	No	COUNTY RD 193 5801A	CANDELARIA ROGER	9105 SIXTH ST	LANHAM	MD 20706-0000	34U-5W SEC 24	19.859	107.3412824W 37.1704889N
39	589726400024	Access		Federal					0.000	
40	589725400014	Access	HIGHWAY 151 X	MARTINEZ MEL	5671 STATE HWY 151	PAGOSA SPRINGS	CO 81147-0000	34U-5W SEC 25	118.324	107.3322090W 37.1605486N
41	589724400007	No	COUNTY RD 193 5879	CANDELARIA LUCY S &	PO BOX 1812	ARBOLES	CO 81121-0000	34U-5W SEC 24	39.283	107.3367759W 37.1750192N
42	589530100037	No Response	HIGHWAY 151 5461	CHIMNEY ROCK COAL CO C/O	3633 INLAND EMPIRE BLVD STE 480	ONTAIRO	CA 91764-0000	34U-4W SEC 30	79.285	107.3163700W 37.1642304N
43	589530100020	Access	HIGHWAY 151 5671	MARTINEZ MEL	5671 STATE HWY 151	PAGOSA SPRINGS	CO 81147-0000	34U-4W SEC 30	243.370	107.3175202W 37.1642058N
44	589529100026	No Response	HIGHWAY 151 X	CAZEDESSUS CAMILE E JR	PO BOX 2340	PAGOSA SPRINGS	CO 81147-2340	34U-4W SEC 29	15.597	107.3094626W 37.1633518N
45	589725100012	Access		Federal					0.000	

Notes:

- Indicates property access was denied
- Indicates landowner did not respond to access request

TABLE 2

GAS SAMPLE ANALYTICAL RESULTS  
2007 FRUITLAND OUTCROP MONITORING  
ARCHULETA COUNTY, COLORADO

Isotech Lab No.	Sample Date	Sample Name	Ar %	O <sub>2</sub> %	CO <sub>2</sub> %	N <sub>2</sub> %	CO %	C <sub>1</sub> %	C <sub>2</sub> %	C <sub>2</sub> H <sub>4</sub> %	C <sub>3</sub> %	iC <sub>4</sub> %	nC <sub>4</sub> %	iC <sub>5</sub> %	nC <sub>5</sub> %	C <sub>6</sub> + %	d <sup>13</sup> CO <sub>2</sub> ‰	d <sup>13</sup> C <sub>1</sub> ‰	dDC <sub>1</sub> ‰	H <sub>2</sub> S %	Specific Gravity	BTU	Helium dilution factor *
103425	9/7/2006	Squaw Creek	0.207	0.073	3.79	10.47	ND	85.46	ND	ND	ND	ND	ND	ND	ND	ND	NM	-60.67	-375.1	NM	0.636	866	NA
127704	11/14/2007	Stollsteimer Creek	0.027	2.37	0.82	0	ND	99.12	0.029	ND	ND	ND	ND	ND	ND	ND	NM	-44.88	-229.1	NM	0.604	911	NA

Notes:

Chemical analysis based on standards accurate to within 2%

\* Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace.

- Ar = argon
- O<sub>2</sub> = oxygen
- CO<sub>2</sub> = carbon dioxide
- N<sub>2</sub> = nitrogen
- CO = carbon monoxide
- C<sub>1</sub> = methane
- C<sub>2</sub> = ethane
- C<sub>2</sub>H<sub>4</sub> = ethylene
- C<sub>3</sub> = propane
- iC<sub>4</sub> = iso-butane
- ND = not detected above laboratory detection limit
- nC<sub>4</sub> = n-butane
- iC<sub>5</sub> = iso-pentane
- nC<sub>5</sub> = n-pentane
- C<sub>6+</sub> = hexanes
- d<sup>13</sup>CO<sub>2</sub> = isotopic carbon of carbon dioxide
- d<sup>13</sup>C<sub>1</sub> = isotopic carbon of methane
- dDC<sub>1</sub> = isotopic hydrogen of methane
- H<sub>2</sub>S = hydrogen sulfide
- BTU = british thermal units
- NM = not measured
- NA = not applicable



TABLE 3

**GAS FLUX MEASUREMENT RESULTS  
2007 FRUITLAND OUTCROP MONITORING  
ARCHULETA COUNTY, COLORADO**

SITE	POINT ID	NORTHING	EASTING	DATE	CH4flux (moles/m2/day)	H2Sflux (moles/m2/day)	CO2flux (moles/m2/day)	CAHMBER	PRESS (HPa):	TEMP DegC	CH4slope (ppm/sec)	H2Sslope (ppm/sec)	CO2slope (ppm/sec)	AcK
Beaver Creek	BVC01	1234725	2425084	10/10/2007	0.00000	0.00720	0.22986	A	777.28000	29.84790	0.00000	0.03000	0.95800	0.23993
Beaver Creek	BVC02	1234736	2425287	10/10/2007	0.16108	0.01534	0.42091	A	778.80000	30.73810	0.67200	0.06400	1.75600	0.23970
Beaver Creek	BVC03	1234835	2425384	10/10/2007	0.11584	0.00368	0.43073	A	799.66000	31.58660	0.47200	0.01500	1.75500	0.24543
Beaver Creek	BVC04	1235028	2425384	10/10/2007	0.20274	0.01519	0.36014	A	776.88000	32.91980	0.85400	0.06400	1.51700	0.23740
Beaver Creek	BVC05	1234927	2425500	10/10/2007	0.10407	0.00534	0.36146	A	795.88000	33.69840	0.42900	0.02200	1.49000	0.24259
Beaver Creek	BVC06	1235039	2425273	10/10/2007	0.08673	0.01772	0.10044	A	777.15000	34.42980	0.36700	0.07500	0.42500	0.23632
Beaver Creek	BVC07	1235032	2425183	10/10/2007	0.05167	0.01014	0.09012	A	777.15000	34.95560	0.21900	0.04300	0.38200	0.23592
Beaver Creek	BVC08	1235029	2425060	10/10/2007	0.08802	0.00706	0.09320	A	776.10000	35.28040	0.37400	0.03000	0.39600	0.23535
Beaver Creek	BVC09	1234941	2425077	10/10/2007	0.17242	0.01270	0.25780	A	776.10000	35.44750	0.73300	0.05400	1.09600	0.23522
Beaver Creek	BVC10	1234929	2425162	10/10/2007	0.00000	0.00519	0.26666	A	777.82000	35.40300	0.00000	0.02200	1.13100	0.23578
Beaver Creek	BVC11	1234934	2425278	10/10/2007	0.00000	0.00920	0.21629	A	778.12000	35.40000	0.00000	0.03900	0.91700	0.23587
Beaver Creek	BVC12	1234935	2425379	10/10/2007	0.00000	0.00589	0.27813	A	776.91000	35.40000	0.00000	0.02500	1.18100	0.23550
Beaver Creek	BVC13	1234838	2425281	10/10/2007	0.00000	0.00966	0.26771	A	777.58000	35.46330	0.00000	0.04100	1.13600	0.23566
Beaver Creek	BVC14	1234835	2425168	10/10/2007	0.16065	0.00891	0.36418	A	795.21000	35.64630	0.66700	0.03700	1.51200	0.24086
Little Squaw Creek	LSC01	1208938	2443442	10/10/2007	0.04746	0.01057	0.22477	A	791.40000	27.83730	0.19300	0.04300	0.91400	0.24592
Little Squaw Creek	LSC02	1208934	2443241	10/10/2007	0.07659	0.00712	0.12543	A	791.40000	28.39400	0.31200	0.02900	0.51100	0.24547
Little Squaw Creek	LSC03	1208740	2443245	10/10/2007	0.21713	0.00660	0.38388	A	791.44000	29.59070	0.88800	0.02700	1.57000	0.24451
Little Squaw Creek	LSC04	1208546	2443253	10/10/2007	0.09091	0.00219	0.17962	A	791.44000	30.57450	0.37300	0.00900	0.73700	0.24372
Little Squaw Creek	LSC05	1208528	2443029	10/10/2007	0.05667	0.00584	0.21231	A	791.44000	31.22150	0.23300	0.02400	0.87300	0.24320
Little Squaw Creek	LSC06	1208738	2443035	10/10/2007	0.05779	0.00534	0.17749	A	791.03000	31.55250	0.23800	0.02200	0.73100	0.24281
Little Squaw Creek	LSC07	1208731	2442847	10/10/2007	0.00218	0.00534	0.18393	A	791.03000	31.75970	0.00900	0.02200	0.75800	0.24265
Little Squaw Creek	LSC08	1208551	2442842	10/10/2007	0.02262	0.00447	0.22919	A	810.84000	31.93920	0.09100	0.01800	0.92200	0.24858
Little Squaw Creek	LSC09	1208331	2442841	10/10/2007	0.02939	0.00413	0.13603	A	792.65000	32.03990	0.12100	0.01700	0.56000	0.24292
Little Squaw Creek	LSC10	1208331	2442627	10/10/2007	0.00605	0.00799	0.17993	A	790.09000	32.00000	0.02500	0.03300	0.74300	0.24217
Little Squaw Creek	LSC11	1208530	2442636	10/10/2007	0.04367	0.01262	0.27222	A	791.57000	32.00000	0.18000	0.05200	1.12200	0.24262
Little Squaw Creek	LSC12	1208333	2442434	10/10/2007	0.12790	0.01066	0.14340	A	791.03000	32.28380	0.52800	0.04400	0.59200	0.24223
Little Squaw Creek	LSC13	1208526	2442441	10/10/2007	0.22795	0.01257	0.18371	A	790.90000	32.86860	0.94300	0.05200	0.76000	0.24173
Little Squaw Creek	LSC14	1208520	2442225	10/10/2007	0.00000	0.00818	0.05319	A	789.55000	33.67980	0.00000	0.03400	0.22100	0.24068
Little Squaw Creek	LSC15	1208339	2442242	10/10/2007	0.06883	0.00794	0.24065	A	790.63000	34.12760	0.28600	0.03300	1.00000	0.24065
Little Squaw Creek	LSC16	1208148	2442215	10/10/2007	0.01847	0.00886	0.35040	A	810.04000	34.52590	0.07500	0.03600	1.42300	0.24624
Little Squaw Creek	LSC17	1207936	2442227	10/10/2007	0.04298	0.00264	0.19975	A	790.25000	34.70550	0.17900	0.01100	0.83200	0.24009
Little Squaw Creek	LSC18	1207927	2442037	10/10/2007	0.06060	0.00671	0.32430	A	788.61000	34.80000	0.25300	0.02800	1.35400	0.23952
Little Squaw Creek	LSC19	1208131	2442026	10/10/2007	0.16023	0.00671	0.11688	A	789.15000	35.01350	0.66900	0.02800	0.48800	0.23951
Little Squaw Creek	LSC20	1208119	2441830	10/10/2007	0.19589	0.00860	0.11132	A	788.50000	35.55850	0.82000	0.03600	0.46600	0.23889
Little Squaw Creek	LSC21	1207936	2441822	10/10/2007	0.02170	0.00644	0.20653	A	788.91000	36.23890	0.09100	0.02700	0.86600	0.23849
Peterson Gulch	PET02	1205345	2456246	10/12/2007	0.00000	0.00640	0.02340	A	782.30000	23.94620	0.00000	0.02600	0.09500	0.24628
Peterson Gulch	PET04	1205527	2456235	10/12/2007	0.22867	0.00758	0.07802	A	784.29000	26.78620	0.93500	0.03100	0.31900	0.24457
Peterson Gulch	PET05	1205733	2456220	10/12/2007	0.15249	0.00923	0.06702	A	783.35000	28.59010	0.62800	0.03800	0.27600	0.24281

TABLE 3 (continued)

**GAS FLUX MEASUREMENT RESULTS  
2007 FRUITLAND OUTCROP MONITORING  
ARCHULETA COUNTY, COLORADO**

SITE	POINT ID	NORTHING	EASTING	DATE	CH4flux (moles/m2/day)	H2Sflux (moles/m2/day)	CO2flux (moles/m2/day)	CAHMBER	PRESS (HPa):	TEMP DegC	CH4slope (ppm/sec)	H2Sslope (ppm/sec)	CO2slope (ppm/sec)	AcK
Peterson Gulch	PET07	1205580	2456343	10/12/2007	0.04187	0.00698	0.10902	A	779.87000	29.94740	0.17400	0.02900	0.45300	0.24065
Peterson Gulch	PET08	1205538	2456445	10/12/2007	0.14922	0.00457	0.08290	A	782.68000	31.49960	0.62100	0.01900	0.34500	0.24029
Peterson Gulch	PET09	1205330	2456441	10/12/2007	0.05729	0.00597	0.08593	A	781.76000	33.15870	0.24000	0.02500	0.36000	0.23871
Peterson Gulch	PET10	1203971	2456889	10/12/2007	0.03142	0.00714	0.10640	A	784.16000	34.95740	0.13200	0.03000	0.44700	0.23804
Peterson Gulch	PET11	1203679	2458173	10/12/2007	0.05188	0.00690	0.21559	A	784.83000	35.32580	0.21800	0.02900	0.90600	0.23796
Peterson Gulch	PET13	1202842	2459195	10/12/2007	0.02450	0.00785	0.27970	A	785.78000	35.85690	0.10300	0.03300	1.17600	0.23784
Peterson Gulch	PET15	1203085	2459045	10/12/2007	0.04205	0.00689	0.08482	A	785.78000	36.17560	0.17700	0.02900	0.35700	0.23759
Peterson Gulch	PET16	1202457	2459739	10/12/2007	0.10646	0.00640	0.14060	A	786.18000	36.98210	0.44900	0.02700	0.59300	0.23710
Peterson Gulch	PET17	1201723	2460418	10/12/2007	0.11730	0.00782	0.16848	A	787.42000	37.64200	0.49500	0.03300	0.71100	0.23697
Peterson Gulch	PET19	1201163	2460816	10/12/2007	0.08284	0.01018	0.14793	A	787.42000	38.00500	0.35000	0.04300	0.62500	0.23669
Peterson Gulch	PET20	1200954	2460815	10/12/2007	0.00000	0.00521	0.11145	A	788.20000	38.39420	0.00000	0.02200	0.47100	0.23663
Peterson Gulch	PET22	1200747	2460806	10/12/2007	0.00946	0.01112	0.17102	A	788.20000	38.50000	0.04000	0.04700	0.72300	0.23655
Peterson Gulch	PET23	1200748	2460628	10/12/2007	0.03116	0.00968	0.14802	A	786.31000	38.37310	0.13200	0.04100	0.62700	0.23608
Peterson Gulch	PET24	1200951	2460606	10/12/2007	0.00000	0.01016	0.17104	A	786.31000	38.15520	0.00000	0.04300	0.72400	0.23624
Peterson Gulch	PET25	1201168	2460614	10/12/2007	0.00000	0.00640	0.07468	A	788.50000	37.92520	0.00000	0.02700	0.31500	0.23708
Pole Gulch	PG01	1207005	2446102	10/11/2007	0.29898	0.00463	0.19607	A	785.64000	28.16790	1.22600	0.01900	0.80400	0.24387
Pole Gulch	PG02	1207214	2446297	10/11/2007	0.00000	0.00194	0.24318	A	785.64000	29.92760	0.00000	0.00800	1.00300	0.24245
Pole Gulch	PG03	1207408	2446458	10/11/2007	0.00000	0.00411	0.09945	A	786.72000	30.92950	0.00000	0.01700	0.41100	0.24198
Pole Gulch	PG04	1207604	2446485	10/11/2007	0.02368	0.00556	0.18218	A	787.39000	31.64620	0.09800	0.02300	0.75400	0.24162
Pole Gulch	PG05	1207619	2446688	10/11/2007	0.15217	0.00555	0.11045	A	788.34000	32.60250	0.63100	0.02300	0.45800	0.24115
Pole Gulch	PG06	1207826	2446690	10/11/2007	0.01588	0.00337	0.19489	A	788.34000	33.29600	0.06600	0.01400	0.81000	0.24061
Pole Gulch	PG07	1207819	2446484	10/11/2007	0.00000	0.01081	0.20421	A	788.07000	33.65550	0.00000	0.04500	0.85000	0.24024
Pole Gulch	PG08	1208009	2446678	10/11/2007	0.06301	0.00575	0.17919	A	786.99000	34.10470	0.26300	0.02400	0.74800	0.23956
Pole Gulch	PG09	1208013	2446864	10/11/2007	0.02154	0.00814	0.10126	A	787.56000	34.56610	0.09000	0.03400	0.42300	0.23938
Pole Gulch	PG10	1208201	2446673	10/11/2007	0.03807	0.00766	0.18723	A	788.47000	34.86480	0.15900	0.03200	0.78200	0.23942
Squaw Creek	SC01	1215303	2436375	10/11/2007	0.04878	0.00642	0.13634	A	777.42000	32.42950	0.20500	0.02700	0.57300	0.23795
Squaw Creek	SC04	1215095	2436672	10/11/2007	0.00000	0.00617	0.11696	A	777.42000	33.32870	0.00000	0.02600	0.49300	0.23725
Squaw Creek	SC07	1214831	2436992	10/11/2007	0.00000	0.00570	0.15187	A	777.42000	33.27050	0.00000	0.02400	0.64000	0.23730
Squaw Creek	SC10	1214480	2437233	10/11/2007	0.00000	0.00570	0.16798	A	778.12000	33.16060	0.00000	0.02400	0.70700	0.23759
Squaw Creek	SC14	1214367	2437405	10/11/2007	0.00000	0.00381	0.08414	A	780.28000	33.01790	0.00000	0.01600	0.35300	0.23836
Squaw Creek	SC16	1214273	2437448	10/11/2007	0.00000	0.00952	0.14681	A	778.63000	32.92300	0.00000	0.04000	0.61700	0.23793
Squaw Creek	SC19	1214245	2437500	10/11/2007	0.02356	0.00547	0.12185	A	779.34000	33.14290	0.09900	0.02300	0.51200	0.23798
Squaw Creek	SC21	1214116	2437993	10/11/2007	0.07065	0.00356	0.02228	A	779.44000	34.35590	0.29800	0.01500	0.09400	0.23707
Squaw Creek	SC24	1213966	2438387	10/11/2007	0.00000	0.00664	0.12026	A	779.71000	34.30000	0.00000	0.02800	0.50700	0.23720
Squaw Creek	SC28	1213721	2438761	10/11/2007	0.00000	0.00357	0.05289	A	782.68000	34.08840	0.00000	0.01500	0.22200	0.23826
Stollsteimer Creek	ST01			10/16/2007	0.00000	0.00000	0.07701	A	801.54000	21.82590	0.00000	-0.00100	0.30300	0.25415
Stollsteimer Creek	ST15	1185275	2468635	10/16/2007	0.14197	0.00307	0.14274	A	812.77000	24.02860	0.55500	0.01200	0.55800	0.25580
Stollsteimer Creek	ST20	1185280	2468660	10/16/2007	0.00000	0.00000	0.07701	A	801.54000	21.82590	0.00000	-0.00100	0.30300	0.25415

TABLE 3 (continued)

GAS FLUX MEASUREMENT RESULTS  
2007 FRUITLAND OUTCROP MONITORING  
ARCHULETA COUNTY, COLORADO

SITE	POINT ID	NORTHING	EASTING	DATE	CH4flux (moles/m2/day)	H2Sflux (moles/m2/day)	CO2flux (moles/m2/day)	CAHMBER	PRESS (HPa):	TEMP DegC	CH4slope (ppm/sec)	H2Sslope (ppm/sec)	CO2slope (ppm/sec)	AcK
Stollsteimer Creek	ST24	1185312	2468651	10/16/2007	0.05275	0.00100	0.10601	A	801.44000	25.25540	0.21000	0.00400	0.42200	0.25120
Stollsteimer Creek	ST30	1185522	2468556	10/16/2007	0.02981	0.00351	0.11522	A	801.44000	26.11310	0.11900	0.01400	0.46000	0.25048
Stollsteimer Creek	ST37	1186203	2469016	10/16/2007	0.14535	0.00506	0.22650	A	812.09000	27.31910	0.57500	0.02000	0.89600	0.25279
Stollsteimer Creek	ST42	1185899	2469007	10/16/2007	0.04729	0.00224	0.22476	A	801.04000	27.85130	0.19000	0.00900	0.90300	0.24891
Stollsteimer Creek	ST43	1185904	2468687	10/16/2007	0.00000	0.00522	0.18168	A	800.87000	28.23260	0.00000	0.02100	0.73100	0.24854
Stollsteimer Creek	ST46	1185598	2468678	10/16/2007	0.00000	0.00546	0.19642	A	800.87000	28.50550	0.00000	0.02200	0.79100	0.24831
Stollsteimer Creek	ST47	1185394	2468993	10/16/2007	0.00000	0.01240	0.24531	A	800.64000	28.75330	0.00000	0.05000	0.98900	0.24804
Stollsteimer Creek	ST48	1185097	2468262	10/16/2007	0.01782	0.00198	0.09950	A	800.37000	29.29080	0.07200	0.00800	0.40200	0.24752
Big Horn Schomburg #1	SCH03	1194629	2459556	10/11/2007	0.10697	0.00438	0.15697	A	816.64000	23.18130	0.41500	0.01700	0.60900	0.257753
Big Horn Schomburg #1	SCH04	1194627	2459522	10/11/2007	0.03377	0.00609	0.07972	A	799.39000	21.34190	0.13300	0.02400	0.31400	0.253885
Big Horn Schomburg #1	SCH05	1194629	2459480	10/11/2007	0.23640	0.00476	0.09050	A	798.85000	24.89770	0.94300	0.01900	0.36100	0.250686
Big Horn Schomburg #1	SCH06	1194591	2459525	10/11/2007	0.15615	0.00549	0.09928	A	798.85000	26.39250	0.62600	0.02200	0.39800	0.249435
Big Horn Schomburg #1	SCH07	1194676	2459522	10/11/2007	0.11415	0.00609	0.06443	A	815.56000	27.56170	0.45000	0.02400	0.25400	0.253663

Notes:

Northing and Easting data reported in United States, State Plane South Feet, North American Datum 1983

CH4 - Methane

H2S - Hydrogen Sulfide

CO2 - Carbon Dioxide

PRESS (Hpa) - Pressure reported in hectopascals

TEMP DegC - Temperature reported in degrees Celcius

AcK - Accumulation Chamber Factor

moles/m2/day - moles per meter squared per day

ppm/sec - parts per million per second

TABLE 4

**NATURAL SPRING SURVEY RESULTS  
2007 FRUITLAND OUTCROP MONITORING  
ARCHULETA COUNTY, COLORADO**

Spring ID	Description	Location	Inspection Date	Water Quality Field Measurements						Laboratory Result
				Conductivity (uS)	pH	ORP (mV)	Temperature (C)	TDS (ppm)	Estimated Flow (gal/min)	Methane (mg/L)
Ramona Leonard Spring (Mona)	Spring on Ramona Leonard property, on outcrop near county border.	NESW, Sec 13, T35N, R6W	9/19/2005	NM	NM	NM	NM	NM	NM	<0.0005
			6/1/2006	768.4	6.35	107	13.5	522.4	0.6	<0.0010
			10/13/2007	793.5	7.68	42	11.8	413.4	0.4	<0.02
Ramona Spring	Spring on Ramona Leonard property, unable to locate.	NESW, Sec 13, T35N, R6W	6/1/2006	NM	NM	NM	NM	NM	NM	NS
			10/14/2007	NM	NM	NM	NM	NM	NM	NS
Wood Spring	Spring in Beaver Creek meadow, unable to locate.	SWSE, Sec 13, T35N, R6W	6/1/2006	NM	NM	NM	NM	NM	NM	NS
			10/14/2007	NM	NM	NM	NM	NM	NM	NS
Corrigan Spring	Tributary spring seeping from hillside on southeast side of Beaver Creek, on outcrop. Spring was dry.	SWSE, Sec 13, T35N, R6W	6/1/2006	170.3	6.08	122	17.7	109.7	1	<0.0010
			10/13/2007	NM	NM	NM	NM	NM	NM	NS
Beaver Creek	Sample taken below confluence of Corrigan Spring drainage and Beaver Creek because Corrigan Spring is dry.	SWSE, Sec 13, T35N, R6W	10/13/2007	286.6	8.00	21	10.0	146.6	7	<0.02
Watson Well Spring	Hand dug water well on Watson property, on outcrop. Gate locked, did not receive response to request for property access.	SENW, Sec 19, T35N, R5W	6/1/2006	745.5	7.29	34	13.0	507.7	NM	0.016
			10/14/2007	NM	NM	NM	NM	NM	NM	NS
Grassy Spring	Spring located southwest of outcrop and Watson Well Spring.	NESW, Sec 19, T35N, R5W	6/1/2006	570.3	7.5	-115	29.1	375.3	NM	0.0067
			10/14/2007	88.37	8.18	16	8.6	44.32	<0.25	<0.02
Crain Spring	Tributary spring seeping from embankment in drainage, east of Watson property, on outcrop. Gate locked, did not receive response for property access.	SWSW, Sec 20, T35N, R5W	6/1/2006	570.3	7.5	-115	29.1	375.3	NM	0.0067
			10/14/2007	NM	NM	NM	NM	NM	NM	NS
Seep Spring	Spring located northwest of Walt Spring #1, on outcrop. Unable to locate.	SESW, Sec 04, T34N, R5W	5/24/2006	NM	NM	NM	NM	NM	NM	NS
			10/14/2007	NM	NM	NM	NM	NM	NM	NS
Walt Spring #1	Spring in drainage north of Yellow Jacket Pass, on outcrop, spring is dry.	SESW, Sec 04, T34N, R5W	5/24/2006	524	7.9	86	12.1	345.4	<1	<0.0010
			10/14/2007	NM	NM	NM	NM	NM	NM	NS
Townsend Spring	Spring located north of Hwy 160, east of Yellow Jacket Pass, on outcrop, spring is dry.	SESW, Sec 04, T34N, R5W	5/24/2006	NM	NM	NM	NM	NM	NM	NS
			10/14/2007	NM	NM	NM	NM	NM	NM	NS
Thick Spring	Spring on east side of Yellow Jacket Pass, becomes Squaw Creek, on outcrop.	SESE, Sec 05, T34N, R5W	5/24/2006	325.6	7.80	120	11.7	214.6	2	<0.0010
			10/13/2007	376.5	7.74	32	12.9	192.2	<1	<0.02
Vance Spring #1	Spring in drainage on Vance Property south of Hwy 160, not located on outcrop	NENW, Sec 08, T34N, R5W	5/26/2006	404	7.75	-12	11.6	269.6	1	0.022
			10/14/2007	417.1	7.34	519	9.6	213.2	<0.5	<0.02
Vance Meadow Spring	Spring in meadow south of Vance residence, not located on outcrop	SWNE, Sec 08, T34N, R5W	6/6/2006	459.9	7.2	-60	16.5	310.9	<0.5	0.011
			10/14/2007	389.8	7.2	-67	12.2	195.1	<0.5	0.06

**TABLE 4 (continued)**

**NATURAL SPRING SURVEY RESULTS  
2007 FRUITLAND OUTCROP MONITORING  
ARCHULETA COUNTY, COLORADO**

Spring ID	Description	Location	Inspection Date	Water Quality Field Measurements						Laboratory Result
				Conductivity (uS)	pH	ORP (mV)	Temperature (C)	TDS (ppm)	Estimated Flow (gal/min)	Methane (mg/L)
Big Hole Spring	Spring in Pole Gulch, near contact of Kpc-Kf, on outcrop, spring is dry.	NWNW, Sec 14, T34N, R5W	5/24/2006	365.5	7.27	141	11.7	249.1	<1	0.001
			10/13/2007	NM	NM	NM	NM	NM	NM	NS
Willow Spring	Spring in Pole Gulch, south of Big Hole Spring, on outcrop	NWNW, Sec 14, T34N, R5W	5/24/2006	252.9	7.39	122	14.0	178.7	1	<0.0010
			10/13/2007	318.3	7.42	508	13.9	161.4	<0.25	<0.02
Section 14 Spring (Reich)	Spring located between Pole Gulch and Peterson Gulch, on outcrop	SWNE, Sec 14, T34N, R5W	9/19/2005	412.2	7.93	NM	20.2	277.5	NM	0.0006
			5/24/2006	372.9	7.48	79	13.3	251.5	<1	<0.0010
			10/14/2007	394.7	7.92	0	10.7	198.7	<0.5	0.020
Waypoint 0003 Spring	Unable to locate.	NWSE Sec 13, T34N, R5W	5/26/2006	NM	NM	NM	NM	NM	NM	NS
			10/14/2007	NM	NM	NM	NM	NM	NM	NS
NW John Grub Spring	North spring in Peterson Gulch, on outcrop	NWNE, Sec 11U, T34N, R5W	9/19/2005	415.8	6.97	NM	15.8	282.3	0.1	0.015
			5/26/2006	421.7	7.83	108	27	275.9	<1	0.0016
			10/14/2007	292.2	7.28	-162	17.1	254.8	<0.5	0.30
SE John Grub Spring	South spring in Peterson Gulch, on outcrop	SENE, Sec 11U, T34N, R5W	9/19/2005	524.5	7.04	NM	15.6	358.5	0.25	<0.0005
			5/26/2006	509.5	7.86	-49	24.4	336.9	<1	0.0025
			10/14/2007	980.1	7.29	-68	18.4	513	<0.25	0.65*
Section 10U Spring	Candelaria property spring, not located on outcrop. Access to property denied by landowner.	SWSE, Sec 10U, T34N, R5W	9/19/2005	458.1	7.27	131	10.9	314.7	0.9	<0.0005
			6/6/2006	489.9	7.18	521	20.0	328.2	1	0.0062
			10/14/2007	NM	NM	NM	NM	NM	NM	NS
Spring 1212	Spring at homestead inside cistern, not located on outcrop, located on Candelaria property, access to property denied by landowner.	SWNW, Sec 14U, T34N, R5W	10/7/2005	420	6.59	NM	9.1	NM	NM	0.0005
			6/6/2006	356.6	7.29	75	15.3	243.9	5.28	<0.0010
			10/14/2007	NM	NM	NM	NM	NM	NM	NS
Spring 3424	Spring adjacent to Susie Candelaria residence, used as water supply for both Susie and Gilbert Candelaria residences, on outcrop. Access to property denied by landowner.	SESE, Sec 13U, T34N, R5W	9/14/2005	725.2	6.86	71	16.5	504	1	0.0017
			5/26/2006	641.5	7.97	-98	17.3	436.7	1	0.023
			10/14/2007	NM	NM	NM	NM	NM	NM	NS
Candelaria A Spring	Spring located on Candelaria property, access to property denied by landowner.	NWNE, Sec 24U, T34N, R5W	5/26/2006	NM	NM	NM	NM	NM	NM	NS
			10/14/2007	NM	NM	NM	NM	NM	NM	NS



TABLE 4 (continued)

NATURAL SPRING SURVEY RESULTS  
2007 FRUITLAND OUTCROP MONITORING  
ARCHULETA COUNTY, COLORADO

Spring ID	Description	Location	Inspection Date	Water Quality Field Measurements						Laboratory Result
				Conductivity (uS)	pH	ORP (mV)	Temperature (C)	TDS (ppm)	Estimated Flow (gal/min)	Methane (mg/L)
Candelaria B Spring	Spring located on Candelaria property, access to property denied by landowner.	SWNE, Sec 24U, T34N, R5W	5/26/2006	NM	NM	NM	NM	NM	NM	NS
			10/14/2007	NM	NM	NM	NM	NM	NM	NS
Vaughn Spring	Tributary spring seeping out of embankment on north side of Stollsteimer Creek, on outcrop. Gate locked, did not receive response to request for property access.	SESE, Sec 25, T34N, R5W	6/6/2006	730.7	7.55	521	20.1	509.5	<1	0.0037
			10/14/2007	NM	NM	NM	NM	NM	NM	NS
Miser Spring and Pipeline	Inaccessible due to well infrastructure.	NESW, Sec 28, T34N, R4W	6/6/2006	NM	NM	NM	NM	NM	NM	NS
			10/14/2007	NM	NM	NM	NM	NM	NM	NS

Notes:

uS = microSiemens

ORP = oxidation reduction potential

mV = millivolts

C = degrees celsius

TDS = total dissolved solids

Flow measured using graduated container and stop-watch

\* = highest concentration in 2007

ppm = parts per million

gal/min = gallons per minutes

NM = not measured

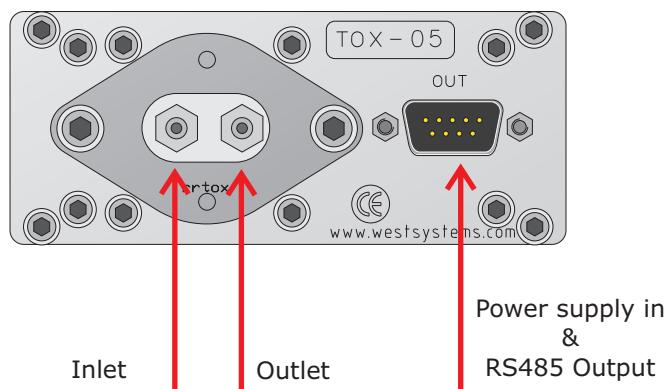
NS = not sampled

< = less than the stated laboratory method detection limit

**APPENDIX A**  
**EQUIPMENT SPECIFICATIONS**



# Hydrogen Sulfide Detector



Pin	Signal
1	Gnd
2	+VDC
3	Gnd
4	RS485-B
5	RS485-A
6	Gnd
7	+12V
8	Gnd
9	RS485-B

## Legenda

**Gnd:** Ground reference for power supply and RS485

**+VDC:** 10-28 Volts Power supply input

**RS485-A:** Digital signal output A

**RS485-B:** Digital signal output B

## Sensor specifications

Ambient conditions:

Air temperature -40°C to 65 °C

Air pressure 700 hPa to 1300 hPa

Air RH 5% - 95% non condensating.

Expected sensor life > 24 months.

Chemical cell order code: WEST H2S-BH

Detector order code: WEST TOX-05-H2S-BH

Factory calibration : 20 ppm

RMS Noise <= 0.02 ppm

Zero Offset <= 0.2 ppm

Max Overrange >= 200 ppm

The chemical cell reaction is:



the gas sample specific consumption is very low:

$$2.5 \times 10^{-10} \text{ moles/Sec per ppm}$$

Due to this consumption the H2S flux is methodically underestimated by a -10% with the AccumulationChamber A and by a -5% when using the accumulation chamber B. Then we advise to use the accumulation chamber B except when the flux is very very low.

## WS-HC detector

### WS-HC Hydrocarbon Flux measurement:

The HydroCarbon detector is based on a double beam infrared spectrometer able to detect methane, hexane, propane and other molecules with HC linkages. The instrument comes calibrated for the methane. *The instrument requires a frequent **zero base-line** calibration that will be done using atmospheric air. The calibration requires 20 second.*

### Detector specifications:

Accuracy 5%

Repeatability 2%

Resolution 22 ppm (Methane equivalent)

Full scale range is 50000 ppm of methane.

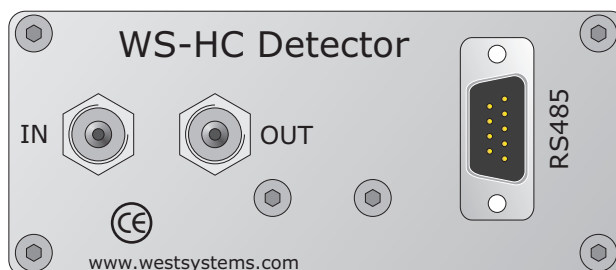
Detection limit 60 ppm.

Methane flux measurement range from 0.1 to 150 moles/m<sup>2</sup> per day.

The precision depends on the measured flux:

range 0.1	5	moles/ m <sup>2</sup> per day	±25%
	5 - 150	moles/ m <sup>2</sup> per day	±10%

The measurement of very low fluxes (< 0.1 moles/m<sup>2</sup>/day) is possible but the error will increase due to the low detector sensitivity.



### RS485 Connector DB9 Male panel

Pin 1	Gnd
Pin 2	+Power supply
Pin 3	Gnd
Pin 4	RS485 B
Pin 5	RS485 A
Pin 6	Gnd
Pin 7	+Power supply
Pin 8	Gnd
Pin 9	RS485 B

The gas fittings can be used with rilsan 6x4 mm tubes or silicon 5x3.2 tubes. Please respect inlet and outlet ports.

# LI-820 Specifications

## CO<sub>2</sub> Specifications

**Measurement Range:** 0-1000 ppm, 0-2000 ppm with 14 cm bench; 0-5000 ppm, 0-20000 ppm with 5 cm bench

**Accuracy:** < 2.5% of reading with 14 cm bench; 4% of reading with 5 cm bench

### Calibration Drift

<sup>1</sup>**Zero Drift:** < 0.15 ppm / °C

<sup>2</sup>**Span Drift at 370 ppm:** < 0.03% / °C

<sup>3</sup>**Total Drift at 370 ppm:** <0.4 ppm / °C

**RMS Noise at 370 ppm with 1 sec Signal Filtering:** < 1 ppm

<sup>1</sup> Zero drift is the change with temperature at 0 concentration

<sup>2</sup> Span drift is the change after re-zeroing following a temperature change

<sup>3</sup> Total drift is the change with temperature without re-zeroing or re-spanning

**Measurement Principle:** Non-Dispersive Infrared

**Traceability:** Traceable gases to WMO standards from 0-3000 ppm. Traceable gases to EPA protocol gases from 3000 to 20000 ppm

**Pressure Compensation Range:** 15 kPa-115 kPa

**Maximum Gas Flow Rate:** 1 liter/minute

**Output Signals:** Two Analog Voltage (0-2.5 V or 0-5 V) and Two Current (4-20 mA)  
Digital: TTL (0-5 V) or Open Collector

**DAC Resolution:** 14-bits across user-specified range

**Source Life:** 18000 hours

**Power Requirements:** Input Voltage 12-30 VDC  
1.2A @ 12V (14 W) maximum during warm-up with heaters on  
0.3 A @ 12 V (3.6 W) average after warm-up with heaters on

**Supply Operating Range:** 12-30 VDC

**Operating Temperature Range:** -20 to 45 °C

**Relative Humidity Range:** 0 to 95% RH, Non-Condensing

**Dimensions:** 8.75" x 6" x 3" (22.23 x 15.25 x 7.62 cm)

**Weight:** 2.2 lbs (1 kg)

The Gasport Gas Tester is designed for gas utility workers to detect methane and certain toxic gases. It is a reliable, simple, versatile tool to help your service technicians get the job done quickly! With multiple ranges and sensing capabilities built into one rugged housing, the Gasport Tester simplifies your work by reducing the number of meters you have to carry on the job.



## Applications

The Gasport Tester's poison-tolerant methane sensor provides three measurement ranges for your daily service needs:

- Open air, safety sampling
- Small, in-home leak detection
- Street/outdoor service line leak detection

## Features and Benefits

- **Proven in field use—rugged and reliable**  
Less costly to maintain, less time in repair
- **Multiple functions in one instrument**  
No need to buy, carry & maintain multiple instruments
- **New, poison-tolerant combustible gas sensor**  
Reduces meter ownership costs
- **User-selectable, “silent” operation mode**  
Reduces customer disturbances and worries
- **Fast warm up time**  
Fastest warm up time in industry saves time
- **Can monitor up to four gases at a time**  
Fewer instruments to carry
- **Show all gas concentrations simultaneously**  
Eliminates guesswork on what reading is displayed
- **Autoranging methane sensor**  
Automatically switches between 0-5% and 5-100% methane ranges
- **Gas readings recorded for later retrieval**  
Can double check readings after job is done
- **Simple manual or automated calibration options**  
Reduces training time and helps ensure accuracy
- **Intrinsically safe**  
Meets safety standards for work in hazardous areas
- **Lifetime warranty on case and electronics**  
Reduced maintenance and lifetime costs



## Specifications

Gas	Range	Resolution
Methane	0–5000 ppm	50 ppm
Methane	0–100% LEL or 0–5% CH <sub>4</sub>	1 % LEL or 0.1% CH <sub>4</sub>
Methane	5–100% CH <sub>4</sub>	1% CH <sub>4</sub>
Oxygen	0–25%	0.1%
Carbon Monoxide	0–1000 ppm	1 ppm
Hydrogen Sulfide	0–100 ppm	1 ppm

<b>Battery types:</b>	NiCd and Alkaline
<b>Case material:</b>	Impact resistant, stainless-steel-fiber-filled polycarbonate
<b>Operating temperature:</b>	normal -10 to 40°C; extended -20 to 50°C
<b>Operating humidity:</b>	Continuous: 15-95% RH, non-condensing Intermittent duty: 5-95% RH, non condensing
<b>Warm up time:</b>	Less than 20 seconds to initial readings
<b>Datalog capacity:</b>	12 hours
<b>Input:</b>	3 clearly marked, metal domed keys
<b>Warranty:</b>	Case and Electronics: Lifetime Sensors and consumable parts: 1 year

**The answer for gas utilities' gas detection needs**

# Ordering Information

## Battery Chargers

Part No.	Description
494716	Omega 120 VAC 50/60Hz
495965	Omega 220 VAC 50/60Hz
801759	Omega 110/220 VAC, Five Unit, 50/60Hz
800525	Omega 8 - 24VDC for vehicle use

## Battery Packs

Part No.	Description
496990	Standard NiCd Rechargeable
800526	Alkaline, Type C
711041	Alkaline, with Thumbscrews
800527	Heavy Duty NiCd Rechargeable

## Sensors

Part No.	Description
813693	Combustible Gas
480566	O <sub>2</sub>
812389	CO
812390	H <sub>2</sub> S

## Protective Boots

Part No.	Description
804955	Black, for NiCd Battery Packs
802806	Orange, for NiCd Battery Packs
806751	Black, for Alkaline Battery Packs
806750	Orange, for Alkaline Battery Packs
806749	Black, for HD NiCd Battery Packs
806748	Orange, for HD NiCd Battery Packs
812833	Yellow Soft Carrying Case with Harness
711022	Black padded Vinyl Carrying Case with Harness

## Sampling Equipment

Part No.	Description
800332	Probe - 1 ft., plastic
800333	Probe - 3 ft., plastic
803561	Probe - 3 ft., plastic (holes 2" from end) (bar hole probe)
803962	Probe - 3 ft., plastic (holes 2" from handle) (solid probe)
803848	Probe - Hot Gas Sampler
710465	Sampling Line - 5 ft., coiled
497333	Sampling Line - 10 ft.
497334	Sampling Line - 15 ft.
497335	Sampling Line - 25 ft.

## Sampling Accessories

Part No.	Description
801582	Replacement Filter, Probe, pkg. of 10
801291	External Filter Holder
014318	Charcoal Filter
711039	Line Scrubber Filter Holder
711059	Line Scrubber Replacement Cartridges, Box of 12
808935	Dust Filter, Pump Module
802897	Water Trap (Teflon) Filter, Pump Module

## Calibration Check Equipment

Part No.	Description
477149	Calibration Kit Model RP with 0.25 lpm Regulator
491041	Calibration Gas - methane, 2.5%
473180	Calibration Gas - 300 ppm CO
813718	Calibration Gas - methane, 2.5% oxygen, 15% 60 ppm CO
813720	Calibration Gas - methane, 2.5% oxygen, 15% 300 ppm CO 10 ppm H <sub>2</sub> S
710288	Gasmiser™ Demand Regulator 0 - 3.0 lpm

## Accessories

Part No.	Description
804679	Data Docking Module Kit. Includes the Data Docking Module, MSA Link Software and Instruction Manual

# Approvals

The Gasport Gas Tester has been designed to meet intrinsic safety testing requirements in certain hazardous atmospheres.

The Gasport Gas Tester is approved by MET (an OSHA Nationally Recognized Testing Laboratory [NRTL]) for use in Class I, Division I, Groups A, B, C, D; Class II, Division I, Groups E, F, G; and Class III Hazardous locations. Gasport tGas Testers sold in Canada are approved by CSA for use in Class I, Division I, Groups A, B, C, and D locations.

Contact MSA at 1-800-MSA-2222 for more information or with questions regarding the status of approvals.

## Gasport Gas Tester Kits

	LEL Display	O <sub>2</sub>	CO	H <sub>2</sub> S	Alarms Always	Alarms Optional	Leak Detect Page	Peak	Alkaline Battery	NiCd Battery	5ft Coiled Line	1ft Probe	Part No.
4-Gas, Selectable, NiCd	•	•	•	•	•	•	•	•	•	•	•	•	711489
4-Gas, Selectable, Alkaline	•	•	•	•	•	•	•	•	•	•	•	•	711490
3-Gas, Selectable, NiCd	•	•	•	•	•	•	•	•	•	•	•	•	711493
3-Gas, Selectable, Alkaline	•	•	•	•	•	•	•	•	•	•	•	•	711494
2-Gas, Selectable, NiCd	•	•	•	•	•	•	•	•	•	•	•	•	711495
2-Gas, Selectable, Alkaline	•	•	•	•	•	•	•	•	•	•	•	•	711496
4-Gas, Alarms On, NiCd	•	•	•	•	•	•	•	•	•	•	•	•	711491
4-Gas, Alarms On, Alkaline	•	•	•	•	•	•	•	•	•	•	•	•	711492

## Assemble-to-Order (ATO) System: You Make the Choices

The ATO System makes it easy to "custom order" the Gasport Gas Tester, configured exactly the way you want it. You can choose from an extensive line of base instrument components and accessories. To obtain a copy of the "ATO System and Price Information for the Gasport Gas Tester," call toll-free 1-800-MSA-2222, and request Bulletin 0804-28. To obtain a copy of the ATO via FAX, call MSA QuickLit Information Service at 1-800-672-9010. At the prompt, request QuickLit Document #2345 (ATO for Gasport Gas Tester).

**Note:** This Data Sheet contains only a general description of the products shown. While uses and performance capabilities are described, under no circumstances shall the products be used by untrained or unqualified individuals and not until the product instructions including any warnings or cautions provided have been thoroughly read and understood. Only they contain the complete and detailed information concerning proper use and care of these products.

ID 08-04-27-MC / May 2000  
© MSA 2000 Printed in U.S.A.



**Corporate Headquarters**  
P.O. Box 426  
Pittsburgh, PA 15230 USA  
Phone (412) 967-3000  
www.MSAnet.com

**U.S. Customer Service Center**  
1-800-MSA-2222

**MSA International**  
Phone (412) 967-3354  
FAX (412) 967-3451

**Offices and representatives worldwide**  
For further information:





## The total GPS platform for all your GIS field requirements

The GeoXT™ handheld, from the GeoExplorer® series, is an essential tool for maintaining your GIS. It's all you need to collect location data, keep existing GIS information up to date, and even mobilize your GIS.

The unique GeoExplorer series combines a Trimble® GPS receiver with a rugged field-ready handheld computer running the Microsoft® Windows Mobile™ 2003 software for Pocket PCs. Plus there's an internal battery that easily lasts for a whole day of GPS operation. The result is tightly integrated, tough, and incredibly powerful.

### High-accuracy integrated GPS

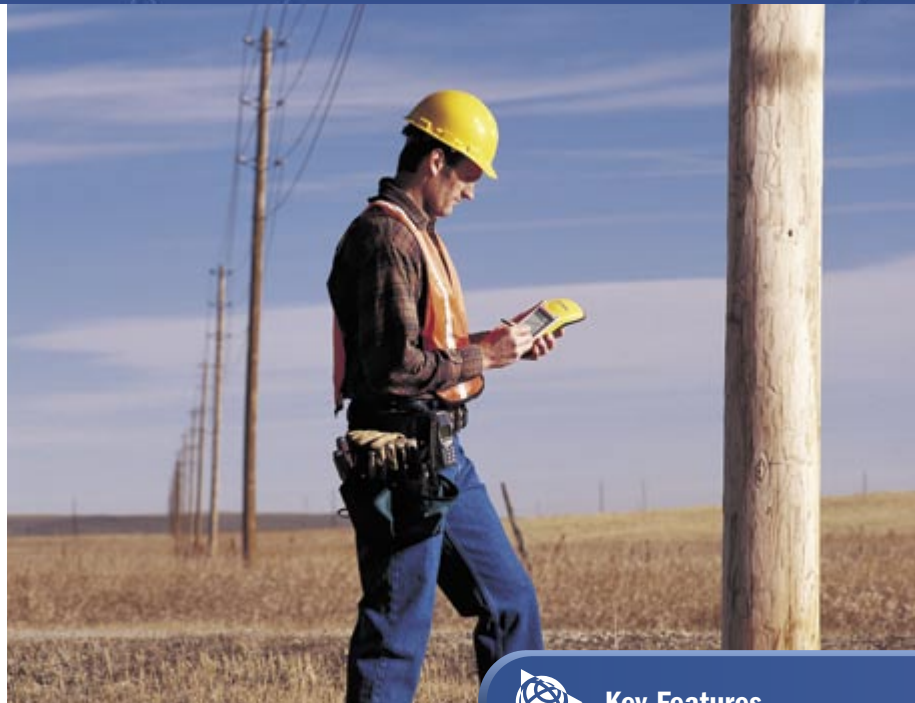
The GeoXT is optimized to provide the reliable, high-accuracy location data you need. Advanced features like EVEREST™ multipath rejection technology let you work under canopy, in urban canyons, or anywhere where accuracy is crucial.

Need submeter accuracy in real-time? Use corrections from a satellite-based augmentation system (SBAS) like WAAS<sup>1</sup> or EGNOS<sup>2</sup>. Want to get that extra edge in precision? Collect data with Trimble's TerraSync™ or GPSCorrect™ software, and then postprocess back in the office.

Because the GPS receiver and antenna are built into the handheld computer, it's never been easier to use GPS in your application. The system is more than just cable-free: it's a totally integrated solution.

### Optimized productivity

Take advantage of the power and flexibility of Windows Mobile software for Pocket PCs by choosing from the most comprehensive range of field software available—whether off-the-shelf or purpose-built. Whatever your needs, Windows



### Key Features

- High-performance submeter GPS with integrated WAAS/EGNOS
- Windows Mobile 2003 software for Pocket PCs, allowing maximum flexibility in software choice
- Rugged handheld with all-day battery
- Advanced color TFT display with backlight
- Integrated Bluetooth for wireless connectivity

Mobile lets you choose a software solution to match your workflow.

Windows Mobile includes familiar Microsoft productivity tools, including Pocket Word, Pocket Excel, and Pocket Outlook®. Pocket Outlook lets you synchronize e-mails, contacts, appointments, and data with your office computer, so whether you're in the office or in the field, you're always up to date.

Go wireless with integrated Bluetooth®\* for connection to other Bluetooth-enabled devices, including cell phones and PCs. You also have the option to use the USB support module to connect to a desktop computer, or use the optional serial clip for cabled connections in the field.

Receive a free copy of Microsoft Streets & Trips\*\* 2004 software with your GeoXT handheld, and take advantage of comprehensive map and travel information for easy navigation and route planning.

### All the memory you need

There's plenty of storage space in the GeoXT for all your GIS data. The fast processor and large memory mean even big graphics files load quickly—and they're crisp and crystal-clear on the advanced TFT outdoor color screen.

From data collection to data maintenance, to mobile GIS and beyond ... the GeoXT is the handheld of choice.

\* Bluetooth type approvals are country specific. GeoExplorer series handhelds are approved for use with Bluetooth in the USA. For a complete list of other countries with Bluetooth approval please refer to:

[www.trimble.com/geo\\_bluetooth.html](http://www.trimble.com/geo_bluetooth.html).

\*\* Microsoft Streets & Trips 2004 software available in US/Canada; Microsoft AutoRoute® 2004 in Europe.



## The total GPS platform for all your GIS field requirements

### Standard features

#### System

- Microsoft Windows Mobile 2003 software for Pocket PCs
- 206 MHz Intel StrongARM processor
- 512 MB non-volatile Flash data storage
- Outdoor color display
- Ergonomic cable-free handheld
- Rugged and water-resistant design
- All-day internally rechargeable battery
- Bluetooth wireless

#### GPS

- Submeter accuracy
- Integrated WAAS<sup>1</sup>/EGNOS<sup>2</sup>
- RTCM real-time correction support
- NMEA and TSIP protocol support
- EVEREST multipath rejection technology

#### Software

- GPS Controller for control of integrated GPS and in-field mission planning
- GPS Connector for connecting integrated GPS to external ports
- File Explorer, Internet Explorer, Pocket Outlook (Inbox, Calendar, Contacts, Tasks, Notes), Sprite Pocket Backup, Transcriber, Pocket Word, Pocket Excel, Pictures, Windows® Media Player, Bluetooth File Transfer, Calculator, ActiveSync®
- Microsoft Streets & Trips/AutoRoute 2004 software

#### Accessories

- Support module with power supply and USB data cable
- Getting Started Guide
- Companion CD includes Outlook 2002 and ActiveSync 3.7.1
- Hand strap
- Pouch
- Stylus

### Optional Features

#### Software

- TerraSync
- GPScorrect for ESRI® ArcPad®
- GPS Pathfinder® Tools Software Development Kit (SDK)
- GPS Pathfinder Office
- Trimble GPS Analyst extension for ArcGIS®

#### Accessories

- Serial clip for field data and power input
- Vehicle power adaptor<sup>3</sup>
- Portable power kit<sup>3</sup>
- Hurricane antenna
- External patch antenna
- Pole-mountable ground plane
- Baseball cap with antenna sleeve
- Beacon-on-a-Belt (BoB™) differential correction receiver<sup>3</sup>
- Hard carry case
- Null modem cable<sup>3</sup>
- Backpack kit

### Technical specifications

#### Physical

Size ..... 21.5 cm × 9.9 cm × 7.7 cm (8.5 in × 3.9 in × 3.0 in)  
 Weight ..... 0.72 kg (1.59 lb) with battery  
 Processor ..... 206 MHz Intel StrongARM SA-1110  
 Memory ..... 64 MB RAM and 512 MB internal Flash disk  
 Power  
     Low (no GPS) ..... 0.6 Watts  
     Normal (with GPS) ..... 1.4 Watts  
     High (with GPS, backlight, and Bluetooth) ..... 2.5 Watts  
 Battery ..... Internal lithium-ion, rapidly rechargeable in unit, 21 Watt-hours

#### Environmental

Temperature  
     Operating ..... -10 °C to +50 °C (14 °F to 122 °F)  
     Storage ..... -20 °C to +70 °C (-4 °F to 158 °F)  
 Humidity ..... 99% non-condensing  
 Casing ..... Wind-driven rain and dust-resistant per IP 54 standard  
     Slip-resistant grip, shock- and vibration-resistant

#### Input/output

Communications ..... Bluetooth for wireless connectivity  
     USB via support module, serial via optional DE9 serial clip adaptor

#### Bluetooth

Certification ..... Bluetooth type approvals are country specific.  
     GeoExplorer series handhelds are approved for use with Bluetooth in the USA.  
     For a complete list of other countries with Bluetooth approval please refer to [www.trimble.com/geoxt\\_ts.asp](http://www.trimble.com/geoxt_ts.asp).

#### Profiles

Both client and host support ..... Serial Port, File Transfer (using OBEX)  
     Client support only ..... Dial-Up Networking, Lan Access  
     Host support only ..... Basic Imaging, Object Push  
 Display ..... Advanced outdoor TFT, 240 × 320 pixel, 65,536 colors, with backlight  
 Audio ..... Microphone and half duplex speaker, record and playback utilities  
 Interface ..... Anti-glare coated touch screen, Soft Input Panel (SIP) virtual keyboard  
     2 hardware control keys plus 4 programmable permanent touch buttons  
     Handwriting recognition software, Audio system events, warnings, and notifications

#### GPS

Channels ..... 12  
 Integrated real-time ..... WAAS<sup>1</sup> or EGNOS<sup>2</sup>  
 Update rate ..... 1 Hz  
 Time to first fix ..... 30 sec (typical)  
 Protocols ..... NMEA (GGA, VTG, GLL, GSA, ZDA, GSV, RMC),  
     TSIP (Trimble Standard Interface Protocol)

#### Accuracy (RMS)<sup>4</sup> after differential correction

Postprocessed<sup>5</sup> ..... Submeter  
 Carrier postprocessed<sup>6</sup>  
     With 10 minutes tracking satellites ..... 30 cm  
 Real-time ..... Submeter

<sup>1</sup> WAAS (Wide Area Augmentation System). Available in North America only.

For more information, see <http://gps.faa.gov/programs/index.htm>.

<sup>2</sup> EGNOS (European Geostationary Navigation Overlay System). Available in Europe only.

For more information, see <http://www.esa.int/export/esaSA/navigation.html>.

<sup>3</sup> Serial clip also required.

<sup>4</sup> Horizontal accuracy. Requires data to be collected with minimum of 4 satellites, maximum PDOP of 6, minimum SNR of 4, minimum elevation of 15 degrees, and reasonable multipath conditions. Ionospheric conditions, multipath signals or obstruction of the sky by buildings or heavy tree canopy may degrade precision by interfering with signal reception. Accuracy varies with proximity to base station by +1 ppm for postprocessing and real-time, and by +5 ppm for carrier postprocessing.

<sup>5</sup> Postprocessing with GPS Pathfinder Office software or GPS Analyst extension for ArcGIS.

<sup>6</sup> Requires collection of carrier data. (Only available with the GPS Pathfinder Office software).

Specifications subject to change without notice.

#### NORTH & SOUTH AMERICA

Trimble Navigation Limited  
 7403 Church Ranch Blvd • Suite 100  
 Westminster, CO 80021 • USA  
 +1-720-887-4374 Phone • +1-720-887-8019 Fax

#### EUROPE, AFRICA & MIDDLE EAST

Trimble GmbH  
 Am Prime Parc 11 • 65479 Raunheim • GERMANY  
 +49-6142-2100-0 Phone • +49-6142-2100-550 Fax

#### ASIA-PACIFIC

Trimble Navigation Australia Pty. Ltd  
 Level 1 • 123 Gotha St • Fortitude Valley  
 Queensland 4006 • AUSTRALIA  
 +61-7-3216-0044 Phone • +61-7-3216-0088 Fax



**APPENDIX B**  
**LABORATORY ANALYTICAL RESULTS**



# ANALYSIS REPORT

Lab #: 127704 Job #: 9102  
 Sample Name/Number: Stollsteimer  
 Company: LT Environmental  
 Date Sampled: 11/14/2007  
 Container: Dissolved Gas Bottle  
 Field/Site Name: MSO716.06  
 Location: Archuleta  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 11/21/2007 Date Reported: 12/19/2007

Component	Chemical mol. %	Chemical Air Free vol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide -----	nd	nd			
Hydrogen Sulfide -----	nd	nd			
Helium -----	0.0030	0.0033			
Hydrogen -----	nd	nd			
Argon -----	0.13	0.027			
Oxygen -----	2.37				
Nitrogen -----	6.91	nd			
Carbon Dioxide -----	0.74	0.82			
Methane -----	89.82	99.12	-44.88	-229.1	
Ethane -----	0.026	0.029			
Ethylene -----	nd	nd			
Propane -----	nd	nd			
Iso-butane -----	nd	nd			
N-butane -----	nd	nd			
Iso-pentane -----	nd	nd			
N-pentane -----	nd	nd			
Hexanes + -----	nd	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 911

Specific gravity, calculated: 0.604

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100 percent. Mol. % is approximately equal to vol. %



**ISOTECH**

Laboratories, Inc. 1308 Parkland Ct. Champaign, IL 61821 217/398-3490

[illegible]

**APPENDIX C**  
**NATURAL SPRING PHOTOGRAPHIC DOCUMENTATION**







Photograph 1 - Beaver Creek.



Photograph 2 - Ramona Leonard Spring (Mona).





Photograph 3 - Thick Spring.



Photograph 4 - Big Hole Spring.





Photograph 5 - Willow Spring.



Photograph 6 - Crain (Grassy) Spring.





Photograph 7 - Crain (Grassy) Spring.



Photograph 8 - Walt Spring #1.





Photograph 9 - Vance Spring #1.



Photograph 10 - Vance Meadow Spring.





Photograph 11 - Section 14 Spring (Reich).



Photograph 12 - NW John Grub Spring.



Photograph 13 - SE John Grub Spring.